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(71) Applicant(s)

Stephen McDermott  
Four ell's, 138a Vine Lane, HILLINGDON, Middlesex,  
UB10 0BQ, United Kingdom

(72) Inventor(s)

Stephen McDermott

(74) Agent and/or Address for Service

E Eder & Co  
39 Cranbrook Road, ILFORD, Essex, IG1 4PA,  
United Kingdom

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U1S S1884 S1885 S2065 S2318

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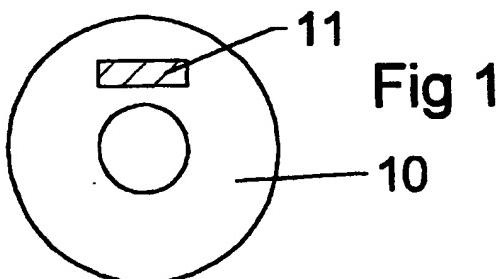
GB 2217425 A      GB 1213727 A      EP 0449795 A1  
EP 0159307 A1      EP 0010835 A1      WO 92/08923 A1  
US 5354521 A      US 5036210 A

(58) Field of Search

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INT CL<sup>6</sup> F16L 9/12 9/127 11/04 11/11 11/12 11/127,  
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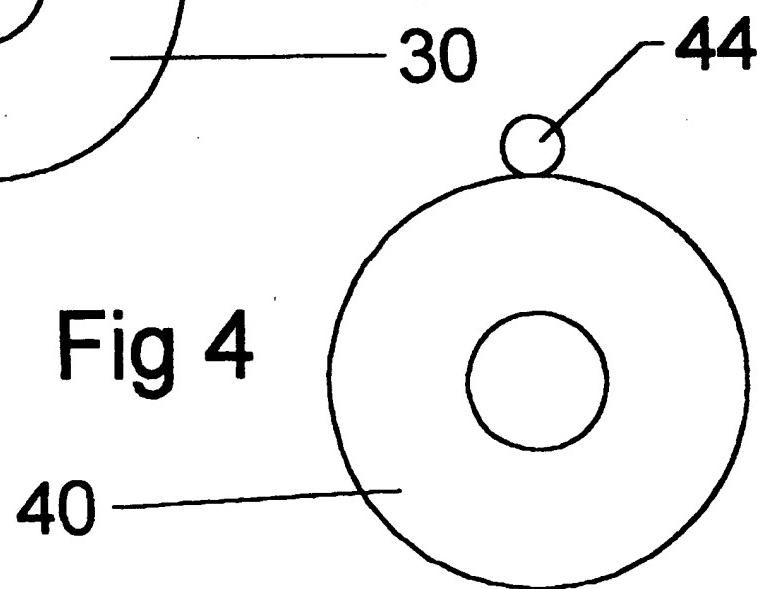
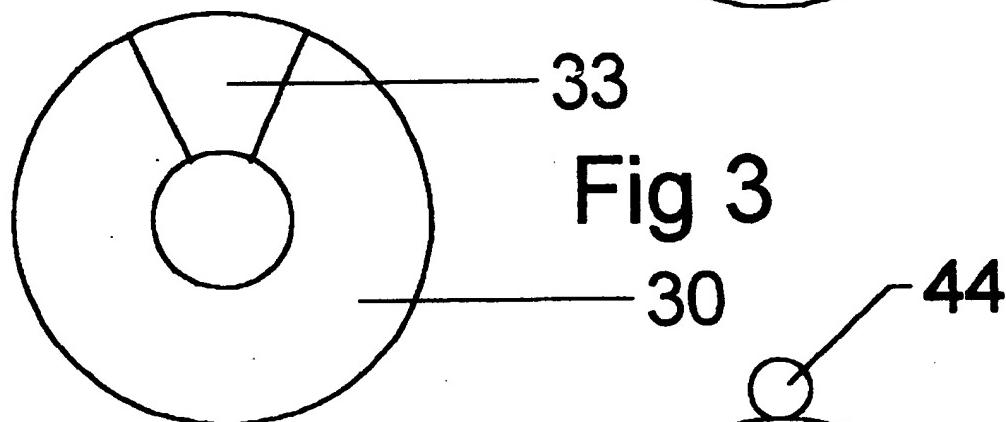
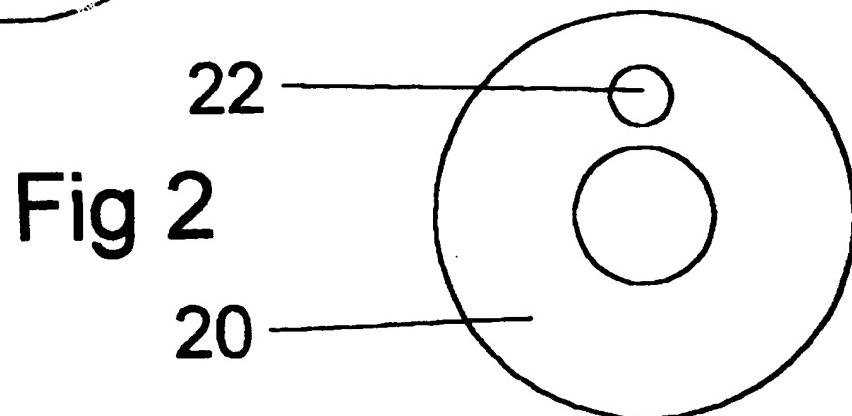
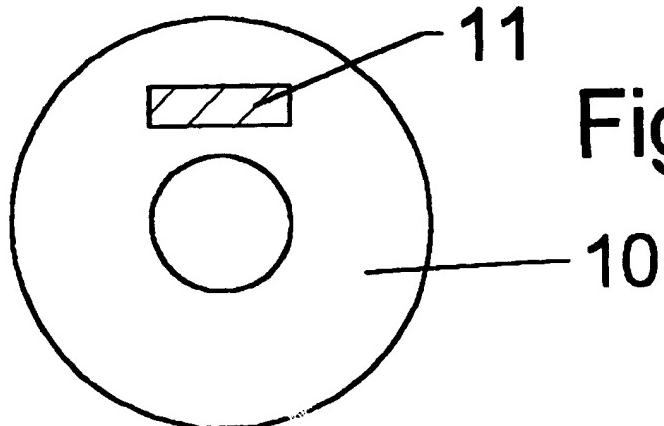
(54) Plastics pipes

(57) A utility pipe 10, to be laid underground, is composed of plastics material and having a metallic element 11 or composition extending continuously therealong to be traceable by a metal detector, e.g. by electrical inductive means. The element 11 is embedded or lies on the interior or exterior wall, e.g as a wire, coated if necessary. Alternatively, the composition is co-extruded and extends across a small arc or all around.



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**PIPS**

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**DESCRIPTION****Background to the Invention**

This invention relates to pipes and in particular to pipes  
10 to be laid underground (hereinafter called "underground  
pipes") for utilities, i.e. use as conduits for electricity  
cables and/or for the transmission of water or gas.

Such underground utility pipes are laid underground at a  
15 depth of about 60 cm and currently are made of plastics  
material. Accordingly, once buried (i.e. laid underground),  
such underground utility pipes cannot be readily located  
other than by digging locating holes or trenches  
20 transversely across the likely path. These "trial and  
error" methods of detection are unduly time consuming,  
labour intensive and expensive, and it is accordingly  
considered desirable to provide underground utility pipes  
which can overcome these disadvantages.

**25 Brief Description of the Invention**

According to one aspect of this invention there is provided  
a utility pipe to be laid underground composed of plastics  
material and having a metallic element extending  
continuously therealong, the metallic element being  
30 traceable by a metal detector, e.g. electrical inductive  
means, when the pipe is buried underground.

Preferably the metallic element extends linearly generally  
parallel to the axis of the pipe. Alternatively it may be  
35 spiral wound in relation to the pipe axis.

The metallic element may be a wire bonded to the exterior of the pipe or, preferably for other than water pipe, to the interior of the pipe.

- 5 In one preferred embodiment, the element is embedded in the plastics material forming the pipe wall.

Alternatively the metallic element may be a metallic composition extruded with the plastics material so as to 10 form the pipe wall therewith. The metallic composition can extend around 360° of the pipe's cross-sectional area or for a small arcuate extent, e.g. less than 60°, of the pipe's cross-sectional area.

15 Brief Description of the Drawings

By way of example one embodiment of this invention will now be described with reference to the accompanying drawings of which:

Figure 1 is a schematic cross-sectional view through an 20 underground water pipe according to a first embodiment of the invention,

Figure 2 is a schematic cross-sectional view through an underground water pipe according to a second embodiment of the invention,

25 Figure 3 is a schematic cross-sectional view through an underground water pipe according to a third embodiment of the invention, and

Figure 4 is a schematic cross-sectional view through an 30 underground water pipe according to a fourth embodiment of the invention.

The underground pipe 10 of Fig 1 is a water pipe of plastics material conforming to BS.6572:1985. It is extruded with an area of its wall in encompassing relation 35 to a continuous metallic element in the form of a soft metal strip 11 that is pulled off a reel by the extrudate

emanating from the extruder head. The arrangement is such that the metal strip 11 is embedded as a continuous metallic element within the wall of the pipe 10. When the pipe is buried, the metal strip 11 can be detected by a conventional metal detector or other inductive sensing means.

The underground water pipe 20 of Fig 2 is identical to the pipe 10 of Fig 1 save that in this embodiment the 10 continuous metallic element is a metal wire 22 of circular cross-section (rather than the rectangular-section metallic strip 11 of Fig 1).

The underground water pipe 40 of Fig 4 is similar to the 15 pipe 20 of Fig 2 save that instead of an embedded wire 22 it has a metal wire 44 of circular cross-section bonded to the exterior surface of the wall of the pipe 40. If in the anticipated use conditions the metal is potentially liable to rust, it may be encased in a plastics material sheath, 20 the latter being bonded to the plastics material of the pipe.

In an alternative arrangement the metal wire 44 can be bonded to the interior surface of the pipe, and even if 25 potentially liable to rust, may then not need to be encased in a plastics material sheath if the underground pipe is to be used for gas or for an electrical conduit.

The underground water pipe 30 of Fig 3 is produced by 30 extruding through a two-part mold, one part extending arcuately through at least 300° and the other part extending through up to 60°. The larger mold part is fed with plastics material (i.e. that conventionally used for producing plastics material pipes of the prior art) to produce the majority of the pipe wall, whilst the smaller 35 mold part is fed with a metallic composition 33 that forms

the remainder of the pipe wall and is bonded by its arcuate sides to the majority of the pipe wall.

- Other modifications and embodiments of the invention will  
5 be readily apparent to those skilled in this art, and all such modifications and embodiments are to be deemed within the ambit and scope of the invention. Thus the invention is not to be deemed limited to the particular embodiment(s) hereinbefore described and such may be varied in  
10 construction and detail without departing from the scope of the patent monopoly hereby sought.

CLAIMS

1. A utility pipe to be laid underground, said pipe being composed of plastics material and having a metallic element extending continuously therealong, the metallic element being traceable by a metal detector when the pipe is buried underground.
2. A utility pipe according to Claim 1 wherein the metallic element is traceable by electrical inductive means.
3. A utility pipe according to Claim 1 or Claim 2, wherein the metallic element extends linearly generally parallel to the axis of the pipe.
4. A utility pipe according to Claim 1 or Claim 2, wherein the metallic element is spiral wound in relation to the pipe axis.
5. A utility pipe according to any preceding Claim, wherein the metallic element comprises a wire bonded to the exterior of the pipe.
6. A utility pipe, other than water pipe, according to any one of Claims 1 to 4, wherein the metallic element comprises a wire bonded to the interior of the pipe.
7. A utility pipe according to any one of Claims 1 to 4, wherein the metallic element is embedded in the plastics material forming the pipe wall.
8. A utility pipe according to any one of Claims 1 to 4, wherein the metallic element comprises a metallic composition extruded with the plastics material so as to form the pipe wall therewith.

9. A utility pipe according to any Claim 8, wherein the metallic composition extends substantially around 360° of the pipe's cross-sectional area.
- 5 10. A utility pipe according to any Claim 8, wherein the metallic composition extends for a small arcuate extent, e.g. less than 60°, of the pipe's cross-sectional area.
- 10 12. A utility pipe substantially as herein described with reference to and/or as illustrated in the accompanying drawings.



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Claims searched: 1-12

Examiner: Roger Binding  
Date of search: 24 April 1997

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): F2P (PC13, PF14); H2C (CCL)

Int Cl (Ed.6): F16L 9/12, 9/127, 11/04, 11/11, 11/12, 11/127; H02G 3/04

Other:

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2217425 A (REDDING), see especially the passage on page 1, line 33, to page 2, line 1.	1, 3, 5-8, 10
X	GB 1213727 A (WESTERN PACKING & SUPPLY)	1-5, 7
X	EP 0449795 A1 (KABELWERK EUPEN), see especially column 6, lines 25 to 36.	1-3, 7
X	EP 0159307 A1 (KABEL- UND GUMMIWERKE), see page 6, line 23 onwards.	1-3, 5, 7
X	EP 0010835 A1 (WIRSBO PEX)	1-3, 5, 7, 8, 10
X	WO 92/08923 A1 (TAMAQUA CABLE PRODUCTS), see especially page 3, line 23, to page 4, line 17.	1, 8, 9
X	US 5354521 A (GOODMAN), see column 5, lines 15 to 55.	1, 7-10
X	US 5036210 A (GOODMAN)	1, 7-10

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| X Document indicating lack of novelty or inventive step   | A Document indicating technological background and/or state of the art.  |
| Y Document indicating lack of inventive step if combined with one or more other documents of same category. | P Document published on or after the declared priority date but before the filing date of this invention.          |
| & Member of the same patent family  | E Patent document published on or after, but with priority date earlier than, the filing date of this application. |